



SEQUENCE LISTING

<110> Wu, Kegiang
Miki, Brian L
Tian, Lining
Brown, Dan

<120> Repressing Gene Expression in Plants

<130> 104107.1

<140> US 09/645,337

<141> 2000-08-25

<150> US 09/383,971

<151> 1999-08-27

<160> 14

<170> PatentIn version 3.2

<210> 1

<211> 1807

<212> DNA

<213> Arabidopsis thaliana

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<212> PRT
<213> Arabidopsis thaliana
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20          25          30

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Gly Gln Gly His Pro Met Lys Pro His Arg Ile Arg Met Thr His Ala
35          40          45

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Leu Leu Ala His Tyr Gly Leu Leu Gln His Met Gln Val Leu Lys Pro
50          55          60

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Phe Pro Ala Arg Glu Arg Asp Leu Cys Arg Phe His Ala Asp Asp Tyr
65          70          75          80

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Val Ser Phe Leu Arg Ser Ile Thr Pro Glu Thr Gln Gln Asp Gln Ile
85          90          95

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Arg Gln Leu Lys Arg Phe Asn Val Gly Glu Asp Cys Pro Val Phe Asp
100 105 110

Gly Leu Tyr Ser Phe Cys Gln Thr Tyr Ala Gly Gly Ser Val Gly Gly
115 120 125

Ser Val Lys Leu Asn His Gly Leu Cys Asp Ile Ala Ile Asn Trp Ala
130 135 140

Gly Gly Leu His His Ala Lys Lys Cys Glu Ala Ser Gly Phe Cys Tyr
145 150 155 160

Val Asn Asp Ile Val Leu Ala Ile Leu Glu Leu Leu Lys Gln His Glu
165 170 175

Arg Val Leu Tyr Val Asp Ile Asp Ile His His Gly Asp Gly Val Glu
180 185 190

Glu Ala Phe Tyr Ala Thr Asp Arg Val Met Thr Val Ser Phe His Lys
195 200 205

Phe Gly Asp Tyr Phe Pro Gly Thr Gly His Ile Gln Asp Ile Gly Tyr
210 215 220

Gly Ser Gly Lys Tyr Tyr Ser Leu Asn Val Pro Leu Asp Asp Gly Ile
225 230 235 240

Asp Asp Glu Ser Tyr His Leu Leu Phe Lys Pro Ile Met Gly Lys Val
245 250 255

Met Glu Ile Phe Arg Pro Gly Ala Val Val Leu Gln Cys Gly Ala Asp
260 265 270

Ser Leu Ser Gly Asp Arg Leu Gly Cys Phe Asn Leu Ser Ile Lys Gly
275 280 285

His Ala Glu Cys Val Lys Phe Met Arg Ser Phe Asn Val Pro Leu Leu
290 295 300

Leu Leu Gly Gly Gly Gly Tyr Thr Ile Arg Asn Val Ala Arg Cys Trp
305 310 315 320

Cys Tyr Glu Thr Gly Val Ala Leu Gly Val Glu Val Gln Asp Lys Met
325 330 335

Pro Glu His Glu Tyr Tyr Glu Tyr Phe Gly Pro Asp Tyr Thr Leu His
340 345 350

Val Ala Pro Ser Asn Met Glu Asn Lys Asn Ser Arg Gln Met Leu Glu
355 360 365

Glu Ile Arg Asn Asp Leu Leu His Asn Leu Ser Lys Leu Gln His Ala
370 375 380

Pro Ser Val Pro Phe Gln Glu Arg Pro Pro Asp Thr Glu Thr Pro Glu
385 390 395 400

Val Asp Glu Asp Gln Glu Asp Gly Asp Lys Arg Trp Asp Pro Asp Ser
405 410 415

Asp Met Asp Val Asp Asp Asp Arg Lys Pro Ile Pro Ser Arg Val Lys
420 425 430

Arg Glu Ala Val Glu Pro Asp Thr Lys Asp Lys Asp Gly Leu Lys Gly
435 440 445

Ile Met Glu Arg Gly Lys Gly Cys Glu Val Glu Val Asp Glu Ser Gly
450 455 460

Ser Thr Lys Val Thr Gly Val Asn Pro Val Gly Val Glu Glu Ala Ser
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Val Lys Met Glu Glu Glu Gly Thr Asn Lys Gly Gly Ala Glu Gln Ala
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Phe Pro Pro Lys Thr
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<211> 1800
<212> DNA
<213> Arabidopsis thaliana

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atgtagggag aagaaagggg catctctctt cagttggggag atgacgggaag taagcgggga 180

gtcagttact tctacgagcc gaagatcgga gactactact acgggtcaagg ccacccgatg 240
 aagcctcacc ggatccgtat ggctcatagc ctaatcattc actatcacct ccacccgtgc 300
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 <213> Arabidopsis thaliana

<220>

<221> MISC_FEATURE

<222> (418)..(418)

<223> "Xaa" is any amino acid

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Arg Lys Arg Arg Val Ser Tyr Phe Tyr Glu Pro Thr Ile Gly Asp Tyr
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Tyr Tyr Gly Gln Gly His Pro Met Lys Pro His Arg Ile Arg Met Ala
35 40 45

His Ser Leu Ile Ile His Tyr His Leu His Arg Arg Leu Glu Ile Ser
50 55 60

Arg Pro Ser Leu Ala Asp Ala Ser Asp Ile Gly Arg Phe His Ser Pro
65 70 75 80

Glu Tyr Val Asp Phe Leu Ala Ser Val Ser Pro Glu Ser Met Gly Asp
85 90 95

Pro Ser Ala Ala Arg Asn Leu Arg Arg Phe Asn Val Gly Glu Asp Cys
100 105 110

Pro Val Phe Asp Gly Leu Phe Asp Phe Cys Arg Ala Ser Ala Gly Gly
115 120 125

Ser Ile Gly Ala Ala Val Lys Leu Asn Arg Gln Asp Ala Asp Ile Ala
130 135 140

Ile Asn Trp Gly Gly Gly Leu His His Ala Lys Lys Ser Glu Ala Ser
145 150 155 160

Gly Phe Cys Tyr Val Asn Asp Ile Val Leu Gly Ile Leu Glu Leu Leu
165 170 175

Lys Met Phe Lys Arg Val Leu Tyr Ile Asp Ile Asp Val His His Gly
180 185 190

Asp Gly Val Glu Glu Ala Phe Tyr Thr Thr Asp Arg Val Met Thr Val
195 200 205

Ser Phe His Lys Phe Gly Asp Phe Phe Pro Gly Thr Gly His Ile Arg
210 215 220

Asp Val Gly Ala Glu Lys Gly Lys Tyr Tyr Ala Leu Asn Val Pro Leu
225 230 235 240

Asn Asp Gly Met Asp Asp Glu Ser Phe Arg Ser Leu Phe Arg Pro Leu
245 250 255

Ile Gln Lys Val Met Glu Val Tyr Gln Pro Glu Ala Val Val Leu Gln
260 265 270

Cys Gly Ala Asp Ser Leu Ser Gly Asp Arg Leu Gly Cys Phe Asn Leu
275 280 285

Ser Val Lys Gly His Ala Asp Cys Leu Arg Phe Leu Arg Ser Tyr Asn
290 295 300

Val Pro Leu Met Val Leu Gly Gly Glu Gly Tyr Thr Ile Arg Asn Val
305 310 315 320

Ala Arg Cys Trp Cys Tyr Glu Thr Ala Val Ala Val Gly Val Glu Pro
325 330 335

Asp Asn Lys Leu Pro Tyr Asn Glu Tyr Phe Glu Tyr Phe Gly Pro Asp
340 345 350

Tyr Thr Leu His Val Asp Pro Ser Pro Met Glu Asn Leu Asn Thr Pro
355 360 365

Lys Asp Met Glu Arg Ile Arg Asn Thr Leu Leu Glu Gln Leu Ser Gly
370 375 380

Leu Ile His Ala Pro Ser Val Gln Phe Gln His Thr Pro Pro Val Asn
385 390 395 400

Arg Val Leu Asp Glu Pro Glu Asp Asp Met Glu Thr Arg Pro Lys Pro
405 410 415

Arg Xaa Trp Ser Gly Thr Ala Thr Tyr Glu Ser Asp Ser Asp Asp Asp
420 425 430

Asp Lys Pro Leu His Gly Tyr Ser Cys Arg Gly Gly Ala Thr Thr Asp
435 440 445

Arg Asp Ser Thr Gly Glu Asp Glu Met Asp Asp Asp Asn Pro Glu Pro
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Asp Val Asn Pro Pro Ser Ser
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 <212> DNA
 <213> Arabidopsis thaliana

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 cagcttttct gtgatttggt attcgacaag gagtttgagc tttctcacac ttggggaaaa 300
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<210> 6
 <211> 245
 <212> PRT
 <213> Arabidopsis thaliana

<400> 6

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Thr Pro Glu Glu Gly Ile Leu Ile His Val Ser Gln Ala Ser Leu Gly
 20 25 30

Glu Cys Lys Asn Lys Lys Gly Glu Phe Val Pro Leu His Val Lys Val
35 40 45

Gly Asn Gln Asn Leu Val Leu Gly Thr Leu Ser Thr Glu Asn Ile Pro
50 55 60

Gln Leu Phe Cys Asp Leu Val Phe Asp Lys Glu Phe Glu Leu Ser His
65 70 75 80

Thr Trp Gly Lys Gly Ser Val Tyr Phe Val Gly Tyr Lys Thr Pro Asn
85 90 95

Ile Glu Pro Gln Gly Tyr Ser Glu Glu Glu Glu Glu Glu Glu Glu
100 105 110

Val Pro Ala Gly Asn Ala Ala Lys Ala Val Ala Lys Pro Lys Ala Lys
115 120 125

Pro Ala Glu Val Lys Pro Ala Val Asp Asp Glu Glu Asp Glu Ser Asp
130 135 140

Ser Asp Gly Met Asp Glu Asp Asp Ser Asp Gly Glu Asp Ser Glu Glu
145 150 155 160

Glu Glu Pro Thr Pro Lys Lys Pro Ala Ser Ser Lys Lys Arg Ala Asn
165 170 175

Glu Thr Thr Pro Lys Ala Pro Val Ser Ala Lys Lys Ala Lys Val Ala
180 185 190

Val Thr Pro Gln Lys Thr Asp Glu Lys Lys Lys Gly Gly Lys Ala Ala
195 200 205

Asn Gln Ser Pro Lys Ser Ala Ser Gln Val Ser Cys Gly Ser Cys Lys
210 215 220

Lys Thr Phe Asn Ser Gly Asn Ala Leu Glu Ser His Asn Lys Ala Lys
225 230 235 240

His Ala Ala Ala Lys
245

<210> 7

<211> 1212

<212> DNA

<213> Arabidopsis thaliana

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aaggcgccgc gc 1212

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<211> 305
<212> PRT
<213> Arabidopsis thaliana

<400> 8

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Thr Pro Glu Glu Asp Ser Leu Val His Ile Ser Gln Ala Ser Leu Asp
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Cys Thr Val Lys Ser Gly Glu Ser Val Val Leu Ser Val Thr Val Gly
35 40 45

Gly Ala Lys Leu Val Ile Gly Thr Leu Ser Gln Asp Lys Phe Pro Gln
50 55 60

Ile Ser Phe Asp Leu Val Phe Asp Lys Glu Phe Glu Leu Ser His Ser
65 70 75 80

Gly Thr Lys Ala Asn Val His Phe Ile Gly Tyr Lys Ser Pro Asn Ile
85 90 95

Glu Gln Asp Asp Phe Thr Ser Ser Asp Asp Glu Asp Val Pro Glu Ala
100 105 110

Val Pro Ala Pro Ala Pro Thr Ala Val Thr Ala Asn Gly Asn Ala Gly
115 120 125

Ala Ala Val Val Lys Ala Asp Thr Lys Pro Lys Ala Lys Pro Ala Glu
130 135 140

Val Lys Pro Ala Glu Glu Lys Pro Glu Ser Asp Glu Glu Asp Glu Ser
145 150 155 160

Asp Asp Glu Asp Glu Ser Glu Glu Asp Asp Asp Ser Glu Lys Gly Met
165 170 175

Asp Val Asp Glu Asp Asp Ser Asp Asp Asp Glu Glu Glu Asp Ser Glu
180 185 190

Asp Glu Glu Glu Glu Glu Thr Pro Lys Lys Pro Glu Pro Ile Asn Lys
195 200 205

Lys Arg Pro Asn Glu Ser Val Ser Lys Thr Pro Val Ser Gly Lys Lys
210 215 220

Ala Lys Pro Ala Ala Ala Pro Ala Ser Thr Pro Gln Lys Thr Glu Lys
225 230 235 240

Lys Lys Gly Gly His Thr Ala Thr Pro His Pro Ala Lys Lys Gly Gly
245 250 255

Lys Ser Pro Val Asn Ala Asn Gln Ser Pro Lys Ser Gly Gly Gln Ser
260 265 270

Ser Gly Gly Asn Asn Asn Lys Lys Pro Phe Asn Ser Gly Lys Gln Phe
 275 280 285

Gly Gly Ser Asn Asn Lys Gly Ser Asn Lys Gly Lys Gly Lys Gly Arg
 290 295 300

Ala
 305

<210> 9
 <211> 40
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

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 <211> 28
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 10
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<210> 11
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<220>
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<210> 12
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 <212> PRT
 <213> Zea mays

<400> 12

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Val Gly Asn Tyr Tyr Tyr Gly Gln Gly His Pro Met Lys Pro His Arg
35 40 45

Ile Arg Met Thr His Ser Leu Leu Ala Arg Tyr Gly Leu Leu Asn Gln
50 55 60

Met Gln Val Tyr Arg Pro Asn Pro Ala Arg Glu Arg Glu Leu Cys Arg
65 70 75 80

Phe His Ala Glu Glu Tyr Ile Asn Phe Leu Arg Ser Val Thr Pro Glu
85 90 95

Thr Gln Gln Asp Gln Ile Arg Leu Leu Lys Arg Phe Asn Val Gly Glu
100 105 110

Glu Cys Pro Val Leu Asp Gly Leu Tyr Ser Phe Cys Gln Thr Tyr Ala
115 120 125

Gly Ala Ser Val Gly Gly Ala Val Lys Phe Asn His Gly His Asp Ile
130 135 140

Ala Ile Asn Trp Ser Gly Gly Leu His His Ala Lys Lys Cys Glu Ala
145 150 155 160

Ser Gly Phe Cys Tyr Val Asn Asp Ile Val Leu Ala Ile Leu Glu Leu
165 170 175

Leu Lys His His Glu Arg Val Leu Tyr Val Asp Ile Asp Ile His His
180 185 190

Gly Asp Gly Val Glu Glu Ala Phe Tyr Thr Thr Asp Arg Val Met Thr
195 200 205

Val Ser Phe His Lys Phe Gly Asp Tyr Phe Pro Gly Thr Gly Asp Ile
210 215 220

Arg Asp Ile Gly His Ser Lys Gly Lys Tyr Tyr Ser Leu Asn Val Pro
225 230 235 240

Leu Asp Asp Gly Ile Asp Asp Glu Ser Tyr Gln Ser Leu Phe Lys Pro
245 250 255

Ile Met Gly Lys Val Met Glu Val Phe Arg Pro Gly Ala Val Val Leu
260 265 270

Gln Cys Gly Ala Asp Ser Leu Ser Gly Asp Arg Leu Gly Cys Phe Asn
275 280 285

Leu Ser Ile Lys Gly His Ala Glu Cys Val Arg Tyr Met Arg Ser Phe
290 295 300

Asn Val Pro Leu Leu Leu Leu Gly Gly Gly Gly Tyr Thr Ile Arg Asn
305 310 315 320

Val Ala Arg Cys Trp Cys Tyr Glu Thr Gly Val Ala Leu Gly Gln Glu
325 330 335

Pro Glu Asp Lys Met Pro Val Asn Glu Tyr Tyr Glu Tyr Phe Gly Pro
340 345 350

Asp Tyr Thr Leu His Val Ala Pro Ser Asn Met Glu Asn Lys Asn Thr
355 360 365

Arg Gln Gln Leu Asp Asp Ile Arg Ser Lys Leu Ser Lys Leu Arg His
370 375 380

Ala Pro Ser Val His Phe Gln Glu Arg Val Pro Asp Thr Glu Ile Pro
385 390 395 400

Glu Gln Asp Glu Asp Gln Asp Asp Pro Asp Glu Arg His Asp Pro Asp
405 410 415

Ser Asp Met Glu Val Asp Asp His Lys Ala Val Glu Glu Ser Ser Arg
420 425 430

Arg Ser Ile Leu Gly Ile Lys Ile Lys Arg Glu Phe Gly Glu Asn Ala
435 440 445

Thr Arg Val Gln Asp Gly Gly Arg Val Ala Ser Glu His Arg Gly Leu
450 455 460

Glu Pro Met Ala Glu Asp Ile Gly Ser Ser Lys Gln Ala Pro Gln Ala
465 470 475 480

Asp Ala Ser Ala Met Ala Ile Asp Glu Pro Ser Asn Val Lys Asn Glu
485 490 495

Pro Glu Ser Ser Thr Lys Leu Gln Gly Gln Ala Ala Ala Tyr His Lys
500 505 510

Pro

<210> 13
 <211> 433
 <212> PRT
 <213> *Saccharomyces cerevisiae*

<400> 13

Met Val Tyr Glu Ala Thr Pro Phe Asp Pro Ile Thr Val Lys Pro Ser
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Asp Lys Arg Arg Val Ala Tyr Phe Tyr Asp Ala Asp Val Gly Asn Tyr
 20 25 30

Ala Tyr Gly Ala Gly His Pro Met Lys Pro His Arg Ile Arg Met Ala
 35 40 45

His Ser Leu Ile Met Asn Tyr Gly Leu Tyr Lys Lys Met Glu Ile Tyr
 50 55 60

Arg Ala Lys Pro Ala Thr Lys Gln Glu Met Cys Gln Phe His Thr Asp
 65 70 75 80

Glu Tyr Ile Asp Phe Leu Ser Arg Val Thr Pro Asp Asn Leu Glu Met
 85 90 95

Phe Lys Arg Glu Ser Val Lys Phe Asn Val Gly Asp Asp Cys Pro Val
 100 105 110

Phe Asp Gly Leu Tyr Glu Tyr Cys Ser Ile Ser Gly Gly Gly Ser Met
 115 120 125

Glu Gly Ala Ala Arg Leu Asn Arg Gly Lys Cys Asp Val Ala Val Asn
 130 135 140

Tyr Ala Gly Gly Leu His His Ala Lys Lys Ser Glu Ala Ser Gly Phe
 145 150 155 160

Cys Tyr Leu Asn Asp Ile Val Leu Gly Ile Ile Glu Leu Leu Arg Tyr
 165 170 175

His Pro Arg Val Leu Tyr Ile Asp Ile Asp Val His His Gly Asp Gly
 180 185 190

Val Glu Glu Ala Phe Tyr Thr Thr Asp Arg Val Met Thr Cys Ser Phe
 195 200 205

His Lys Tyr Gly Glu Phe Phe Pro Gly Thr Gly Glu Leu Arg Asp Ile
210 215 220

Gly Val Gly Ala Gly Lys Asn Tyr Ala Val Asn Val Pro Leu Arg Asp
225 230 235 240

Gly Ile Asp Asp Ala Thr Tyr Arg Ser Val Phe Glu Pro Val Ile Lys
245 250 255

Lys Ile Met Glu Trp Tyr Gln Pro Ser Ala Val Val Leu Gln Cys Gly
260 265 270

Gly Asp Ser Leu Ser Gly Asp Arg Leu Gly Cys Phe Asn Leu Ser Met
275 280 285

Glu Gly His Ala Asn Cys Val Asn Tyr Val Lys Ser Phe Gly Ile Pro
290 295 300

Met Met Val Val Gly Gly Gly Gly Tyr Thr Met Arg Asn Val Ala Arg
305 310 315 320

Thr Trp Cys Phe Glu Thr Gly Leu Leu Asn Asn Val Val Leu Asp Lys
325 330 335

Asp Leu Pro Tyr Asn Glu Tyr Tyr Glu Tyr Tyr Gly Pro Asp Tyr Lys
340 345 350

Leu Ser Val Arg Pro Ser Asn Met Phe Asn Val Asn Thr Pro Glu Tyr
355 360 365

Leu Asp Lys Val Met Thr Asn Ile Phe Ala Asn Leu Glu Asn Thr Lys
370 375 380

Tyr Ala Pro Ser Val Gln Leu Asn His Thr Pro Arg Asp Ala Glu Asp
385 390 395 400

Leu Gly Asp Val Glu Glu Asp Ser Ala Glu Ala Lys Asp Thr Lys Gly
405 410 415

Gly Ser Gln Tyr Ala Arg Asp Leu His Val Glu His Asp Asn Glu Phe
420 425 430

Tyr

<210> 14
 <211> 307
 <212> PRT
 <213> Zea mays

<400> 14

Met Glu Phe Trp Gly Leu Glu Val Lys Pro Gly Ser Thr Val Lys Cys
 1 5 10 15

Glu Pro Gly Tyr Gly Phe Val Leu His Leu Ser Gln Ala Ala Leu Gly
 20 25 30

Glu Ser Lys Lys Ser Asp Asn Ala Leu Met Tyr Val Lys Ile Asp Asp
 35 40 45

Gln Lys Leu Ala Ile Gly Thr Leu Ser Val Asp Lys Asn Pro His Ile
 50 55 60

Gln Phe Asp Leu Ile Phe Asp Lys Glu Phe Glu Leu Ser His Thr Ser
 65 70 75 80

Lys Thr Thr Ser Val Phe Phe Thr Gly Tyr Lys Val Glu Gln Pro Phe
 85 90 95

Glu Glu Asp Glu Met Asp Leu Asp Ser Glu Asp Glu Asp Glu Glu Leu
 100 105 110

Asn Val Pro Val Val Lys Glu Asn Gly Lys Ala Asp Glu Lys Lys Gln
 115 120 125

Lys Ser Gln Glu Lys Ala Val Ala Ala Pro Ser Lys Ser Ser Pro Asp
 130 135 140

Ser Lys Lys Ser Lys Asp Asp Asp Asp Ser Asp Glu Asp Glu Thr Asp
 145 150 155 160

Asp Ser Asp Glu Asp Glu Thr Asp Asp Ser Asp Glu Gly Leu Ser Ser
 165 170 175

Glu Glu Gly Asp Asp Asp Ser Ser Asp Glu Asp Asp Thr Ser Asp Asp
 180 185 190

Glu Glu Glu Asp Thr Pro Thr Pro Lys Lys Pro Glu Val Gly Lys Lys
 195 200 205

Arg Pro Ala Glu Ser Ser Val Leu Lys Thr Pro Leu Ser Asp Lys Lys
 210 215 220

Ala Lys Val Ala Thr Pro Ser Ser Gln Lys Thr Gly Gly Lys Lys Gly
 225 230 235 240

Ala Ala Val His Val Ala Thr Pro His Pro Ala Lys Gly Lys Thr Ile
 245 250 255

Val Asn Asn Asp Lys Ser Val Lys Ser Pro Lys Ser Ala Pro Lys Ser
 260 265 270

Gly Gly Ser Val Pro Cys Lys Pro Cys Ser Lys Ser Phe Ile Ser Glu
 275 280 285

Thr Ala Leu Gln Ala His Ser Arg Ala Lys Met Gly Ala Ser Glu Ser
 290 295 300

Gln Val Gln
 305